

CLAIMS

1. A process for producing a ceramic sheet, which comprises molding a ceramic sheet having a thickness of from 1 to 10 mm by using an extrusion molding machine in which a discharge outlet of a twin screw extruder and a material feed opening of a single screw extruder are connected.
2. The process for producing a ceramic sheet according to Claim 1, wherein the connection portion of the discharge outlet of the twin screw extruder and the material feed opening of the single screw extruder is depressurized.
3. The process for producing a ceramic sheet according to Claim 2, wherein the degree of vacuum at the connection portion of the discharge outlet of the twin screw extruder and the material feed opening of the single screw extruder is at most 1332.2 Pa.
4. The process for producing a ceramic sheet according to any one of Claims 1 to 3, wherein the temperatures of products discharged from the twin screw extruder and the single screw extruder are from 5 to 15°C.
5. The process for producing a ceramic sheet according to any one of Claims 1 to 4, wherein a kneading portion of the twin screw extruder occupies from 30 to 70 vol% of the twin screw extruder.
6. The process for producing a ceramic sheet according to Claim 5, wherein the kneading portion of the twin

screw extruder is made of an abrasive resistant material.

7. The process for producing a ceramic sheet according to any one of Claims 1 to 6, wherein a structure to hold the screw is provided at an intermediate portion and/or 5 the tip of the screw in the twin screw extruder.

8. The process for producing a ceramic sheet according to any one of Claims 1 to 7, wherein a pressure-equalizing can having a length the same as or longer than its diameter is provided in the single screw extruder.

10 9. The process for producing a ceramic sheet according to any one of Claims 1 to 8, wherein a die having a flat portion with a length of at least 5 mm is provided at a discharge outlet of the single screw extruder.

15 10. The process for producing a ceramic sheet according to any one of Claims 1 to 9, wherein a baffle board is provided between the die at the discharge outlet and the pressure-equalizing can in the single screw extruder.

11. The process for producing a ceramic sheet according to any one of Claims 1 to 10, which comprises (a) 20 supplying a powder mixture comprising a ceramic powder, a sintering aid and an organic binder powder through a powder feed portion of the twin screw extruder, (b) supplying a liquid comprising a liquid organic binder, a mold release agent and a plasticizer through a liquid feed portion of the twin screw extruder, (c) kneading the powder mixture and the liquid in the kneading portion in 25 the interior of the twin screw extruder, and (d) molding

a sheet from the single screw extruder equipped with a sheet die.

12. The process for producing a ceramic sheet according to Claim 11, wherein the ceramic powder is a nitride ceramic, the sintering aid powder is a rare earth oxide, the organic binder powder is a cellulose or acrylic binder, and the liquid organic binder is an acrylic binder.

13. The process for producing a ceramic sheet according to Claim 12, wherein the nitride ceramic is aluminum nitride, and the sheet has an apparent density of at least 2.5 g/cm³.

14. The process for producing a ceramic sheet according to any one of Claims 1 to 13, wherein the sheet strength is at least 1.47 MPa.

15. A ceramic substrate obtained by applying debinding and sintering treatments to a ceramic sheet produced by the process as defined in any one of Claims 1 to 14.

16. The ceramic substrate according to Claim 15, wherein the proportion of void is at most 3 vol%.

17. A ceramic circuit board for a module, which comprises a metal circuit formed on one main surface of the ceramic substrate as defined in Claim 15 or 16 and a heatsink joined to the other main surface.

25 18. The ceramic circuit board for a module according to Claim 17, wherein the 10 pC or higher partial discharge inception voltage is at least 5 kV.

19. A module comprising the ceramic circuit board as defined in Claim 17 or 18.